tion. Once a set of eligible frequency channels for the local node has been determined, the next step is for the FA sub-module **308** to determine which channels to assign to transceivers. In certain embodiments, the selection of the subset of channels for assignment to transceivers is accomplished by means of a benefit value function. For each frequency channel eligible for assignment, the benefit value function provides a channel benefit value which is correlated to the desirability of assigning that channel. The benefit value function is tailored to optimize one or more network parameters, such as connectivity. For example, the benefit value function may be designed to increase the number of 1-hop neighbors linked to a particular node. Another benefit function may be designed to increase the number of 2-hop neighbors linked to a particular node, or some combination of the number of 1-hop and 2-hop neighbors. Alternately, the benefit function may be designed to increase the number of exclusive nodes linked to a particular node, or some other network parameter or parameters.

The benefit value calculation begins assuming that the list of eligible channels from the eligibility determination process **804** and a neighbor-frequency channel list are available. In one embodiment, the benefit value calculation proceeds along channel rank. In other words, benefit values for higher-ranked channels are determined before benefit values for lower-ranked channels. For example, if a set of channels **1**, **2**, **3**, **4**, and **5** are ranked according to their numerical indicator, with channel **1** the highest-ranked and channel **5** the lowest-ranked, then the benefit value for channel **1** will be determined first, and the benefit value for channel **5** will be determined last. As will become evident, depending on the selected benefit value calculation algorithm, the order in which benefit values are calculated may determine the benefit of a particular channel. Optionally, channels that are currently assigned are ranked higher than channels that are not currently assigned. By means of illustration, suppose that of the five channels in the previous example (**1**, **2**, **3**, **4**, and **5**), channels **3**, **4**, and **5** are currently assigned to transceivers on the local node and channels **1** and **2** are not. Channels **3**, **4**, and **5** now outrank channels **1** and **2**, and the benefit value calculation will start with channel **3**, proceed through channels **4** and **5**, then move to channel **1** and finally channel **2**. Following are illustrative examples of benefit value calculations. All examples will be based on the network topology depicted in FIG. **1** and table of FIG. **6**. Node X (**102**) is the local node, and the eligibility determination was based on Eligibility Example 2, above, with the stipulation that node X initially has no assigned channels. Thus, eligible channels for X in the follow examples are **1**, **4**, **5**, and **7**.

Benefit Value Example 1

Exclusive 1-Hop Neighbors

In this example, benefit value calculations are directed toward increasing the number of 1-hop neighbor nodes connected to the local node. An exclusive 1-hop neighbor node is a 1-hop neighbor node that has not been accounted for in the overall benefit calculation. Thus, a 1-hop neighbor node that is eligible for both channels **1** and **2** counts as an exclusive node for channel **1** but not for channel **2**, because the benefit value for channel **1** is determined before channel **2**, and the node was already counted for channel **1**. Since no channels have been previously assigned by node X, the default channel ranks hold, and the benefit value for channel **1** is determined first. Nodes A, B, and C are 1-hop neighbors to node X, but only nodes A and B can communicate with node X via channel **1**, because node C is not already using or eligible to use channel **1**. Hence, channel **1** has two exclusive nodes, A and B, and the benefit value for channel **1** is 2. Channels **2** and **3** are ineligible, as per Eligibility Example 2 above. The benefit value for channel **4** is 1, because only node C is already using or eligible to use channel **4**. The benefit value for channel **5** is zero, because although node C is eligible to use channel **5**, node C is not an exclusive neighbor of channel **5**, because node C has already been accounted for in the benefit value calculation for channel **4**. Channel **6** is not allowed, and channel **7** has a benefit value of zero, because while all of nodes A, B, and C are eligible to use channel **7**, none of those nodes are exclusive to channel **7**. Note that if channel **7** had been the highest ranked channel, then it would have had a benefit of 3, because A, B, and C would have been exclusive nodes.

Benefit Value Example 2

Exclusive 2-Hop Neighbors

In this example, benefit value calculations are directed toward increasing the number of 2-hop neighbor nodes connected to the local node. As with Benefit Value Example 1, the benefit value for channel **1** is determined first. If X assigns channel **1**, it will be linked to 2-hop neighbors D, E, and F. Hence, the benefit value for channel **1** is 3. Channels **2** and **3** are ineligible. Channel **4** has a benefit value of 1, because assigning it will link X to 2-hop neighbor H. Assigning channel **5** will do the same, but because H has already been counted for channel **4**, node H is not an exclusive node for channel **5**, and hence the benefit value for channel **5** is zero. Channel **6** is not allowed, and channel **7** also has a benefit value of zero, because D, E, F, and H have already been accounted for.

Optionally, benefit value calculations may be directed toward increasing the benefit values of neighbors that are more important than others in achieving some design goal, such as increasing network connectivity. For example, the importance of a node may be correlated to its available slots for channel assignment. A node Y with a single unassigned transceiver may be more important than a node Z with two unassigned transceivers, because node Y has less linking availability. In this case, eligible channels may be ranked so that a channel that can provide a link to node Y has a larger benefit value than a channel that can provide a link to node Z but not to node Y.

Once benefit values have been determined for all eligible channels, the FA sub-module **308** will assign channels to transceivers based on the benefit values, with the highest-valued channels being assigned first. Channels with zero benefit values will not be assigned to a transceiver. In certain embodiments, if channels have previously been assigned to transceivers at the present node, the FA sub-module **308** will not change the previous channel assignments if none of the previously-assigned channels are determined to have a new benefit value of zero. However, if a channel previously assigned to a transceiver is determined to have a new benefit value of zero, then a different channel with a nonzero benefit is assigned to that transceiver, if such a channel is available. Optionally, after initial frequency channels have been assigned, the FA sub-module **308** also assigns backup frequency channels to one or more transceivers based on the calculated benefit. In all of the above embodiments, any transceiver that is not assigned a frequency channel as a result of the frequency assignment process **712** is assigned a tempo-